



POST-WILDFIRE BLACKWATER ASH FLOWS – BRIEFING PAPER

Large storm events immediately after a wildfire can accelerate surface runoff. Wildfire affects streamflow outputs by contributing ash and charcoal residues. Moderate-to-high intensity rainstorms can cause significant flooding and widespread debris flows. However, ash and charcoal rich discharges (also described as "blackwater flows") have been observed without physical evidence of any debris flows. (RMRS Publication 37604)

Blackwater ash flows are a mixture of charcoal, charred soil and silt formed at very high temperatures that turns into a slurry mix when brought downstream by rain run-off (also described as "black goo") and then the sticky mixture dries and hardens up. It is very rich in nitrogen and has been utilized a fertilizer for plants and gardens. (Cathy Carlock, BAER team leader)

Historically, blackwater ash flows out of the burned mountains and is typically with and/or without the retardant slurry that is used during the fire suppression operations. Blackwater ash flows are usually ash and soil (silt and clay). It is very fine-grained and sticky on the shoes. It is full of organic debris that is rotting and decomposing as it dries out, and hence, it is quite stinky and smelly. The smell usually dissipates within a few days if the weather permits it to dry out, or within a week or two if it stays wet from continuous rains. Once it dries, it usually does not stink as it does not continue to volatilize (conversion of a chemical substance from a liquid or solid state to a gaseous or vapor state) and typically starts to downcut during the next few rains. Time typically cures up this issue. (Salek Shafiqullah, (Coronado NF Hydrologist)

Wildfire ash can have a range of ecological effects in the post-fire environment, including changes in soil chemistry, runoff and erosion rates, and downstream water quality. While the effects of ash on soil chemistry are fairly well understood, there are still important questions regarding ash effects on infiltration, runoff, erosion and water quality. The key issue is that the existing studies indicate considerable between-site variability in ash effects on infiltration, runoff, erosion and water quality and is not well understood. Additional research is ongoing. (USGS State Water Resources Research Institute Program Study)

The photo below shows a section of the San Pedro River after the 2002 Bullock Wildfire that scorched approximately 21,000 acres in the mountains located on the Coronado National Forest, 15 miles northeast of Tucson, Arizona. Notice the size difference of the upper material (dried out "black goo") over the river cobbles. After the wildfire, even though the locals saw and breathed smoke for another month, when the rains came and the blackwater ash goo started flowing out of the mountains, many thought that it was a giant diesel or oil spill flowing down the surface of the San Pedro River – potentially from Fort Huachuca or the I-10 Interstate Bridge crossing over the San Pedro River. It was a slippery, slimy, gooey mess. Locals were somewhat scared and then it dried out and downcut and you could then see all the pieces of ash in the cross section. (From Salek Shafiqullah, Coronado NF Hydrologist)

